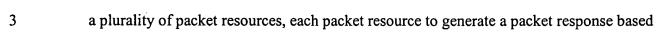
We claim:

CLAIMS

- 1 1. An apparatus comprising:
- a parser to receive a packet and to generate a packet search request;
- a plurality of search resources, each search resource to determine a search response to the
- 4 packet search request; and
- 5 a switch to receive the packet search request from the parser and to multicast the packet
- 6 search request to the plurality of search resources.
 - 2. The apparatus of claim 1, wherein the switch is further configured to receive a search response from each of the plurality of search resources, to select one search response from the received search responses, and to transmit the selected response to the parser.
 - 3. The apparatus of claim 2, wherein the parser is further configured to generate a modification request for the packet based on the search response.
 - 4. The apparatus of claim 3, further comprising a plurality of packet modifiers, each packet modifier configured to modify the packet using the modification request.
- 1 5. The apparatus of claim 4, wherein the switch is configured to transmit the modification
- 2 request from the parser to a packet modifier having a shortest queue.
- 1 6. The apparatus of claim 5, wherein the switch is further configured to transmit the
- 2 modified packet from the packet modifier to the parser.
- 1 7. An apparatus comprising:
- a parser to receive a packet and to generate a packet request;



- 4 on the packet request; and
- 5 a switch to receive the packet request from the parser and to transmit the packet request
- 6 to at least one of the plurality of packet resources.
- 1 8. The apparatus of claim 7, wherein the packet request is selected from the group
- 2 consisting of: a packet search request, a packet modification request, and a session identification
- 3 request.
 - 9. The apparatus of claim 7, wherein the switch is further configured to receive a packet response from at least one of the plurality of packet resources, and to transmit the packet response to the parser.
 - 10. The apparatus of claim 9, wherein the packet response is selected from the group consisting of: a search response, a packet modification, and a session identifier.
 - 11. The apparatus of claim 9, wherein the packet resource is selected from the group consisting of: a packet modifier, a packet search device, and a session device.
- 1 12. An apparatus comprising:
- 2 first means for receiving a packet and for generating a packet request;
- 3 second means for generating a packet response based on the packet request; and
- 4 third means for receiving the packet request from said first means and for transmitting the
- 5 packet request to said second means.

- 1 13. The apparatus of claim 12, wherein the packet request is selected from the group
- 2 consisting of: a packet search request, a packet modification request, and a session identification
- 3 request.
- 1 14. The apparatus of claim 12, wherein said third means further comprises means for
- 2 receiving a packet response from said second means, and for transmitting the packet response to
- 3 said first means.
- 1 15. The apparatus of claim 12, wherein the packet response is selected from the group consisting of: a search response, a packet modification, and a session identifier.
 - 16. The apparatus of claim 12, wherein said second means is selected from the group consisting of: a packet modifier, a packet search device, and a session device.
 - 17. A method comprising:

receiving a packet at a parser;

generating a packet request at the parser; and

- using a switch to transmit the packet request from the parser to a packet resource.
- 1 18. The method of claim 17 further comprising:
- 2 using the packet resource to generate a packet response based on the packet request.
- 1 19. The method of claim 17, wherein the packet request is selected from the group consisting
- of: a packet search request, a packet modification request, and a session identification request.
- 1 20. The method of claim 17 further comprising using the switch to transmit the packet
- 2 response from the packet resource to the parser.

- 1 21. The method of claim 17, wherein the packet response is selected from the group
- 2 consisting of: a search response, a packet modification, and a session identifier.
- 1 22. The method of claim 17, wherein the packet resource is selected from the group
- 2 consisting of: a packet modifier, a packet search device, and a session device.
- 1 23. A method for state based packet processing comprising:
- allocating session/state storage when session processing is started;
- 3 creating a session lock queue to control the order in which packets are processed;
 - executing lock and unlock instructions to access semaphores stored in the session state storage to suspend and restart processing of packets;

executing an instruction for processing of packets selected from the group consisting of: lock queue create, packet insert, packet delete, queue flush, and queue destroy; and

de-allocating session/state storage when session processing is completed.